Installing Natural under OS/390

This document describes step by step how to install Natural under the operating system OS/390 using Adabas system files.

The following topics are covered:

- Prerequisites
- Installation Tape for Natural under OS/390
- Installation Procedure for Natural under OS/390
- Installation Verification for Natural under OS/390

Prerequisites

- A supported version of the OS/390 or z/OS operating system must be installed. For the supported versions of the operating systems, refer to Operating/Teleprocessing Systems Required (in the current Natural Release Notes for Mainframes).
- A supported version of Adabas must be installed. For the supported versions, refer to Natural and Other Software AG Products in the current Natural Release Notes for Mainframes.
- As a rule of thumb, each major Software AG product requires approximately 20 MB space in the Adabas database to store the Natural objects supplied by Software AG.

Installation Tape for Natural under OS/390

The installation tape contains the datasets listed in the table below.

dataset Name	Contents
NAT*nnn*.SYSF	Empty Natural system file
NAT*nnn*.ERRN	Natural error messages
NAT*nnn*.LOAD	Natural load modules
NAT*nnn*.SRCE	Natural source modules and macros
NAT*nnn*.JOBS	Example installation jobs
NAT*nnn*.INPL	Natural system objects
NAT*nnn*.EXPL	Natural example objects

The notation *nnn* in dataset names represents the version number of the product.

Copying the Tape Contents to Disk

If you are using System Maintenance Aid (SMA), refer to the SMA documentation (included on the current edition of the Natural documentation CD).

If you are **not** using SMA, follow the instructions below.

This section explains how to:

- Copy data set COPY.JOB from tape to disk.
- Modify this data set to conform with your local naming conventions.

The JCL in this data set is then used to copy all data sets from tape to disk.

If the datasets for more than one product are delivered on the tape, the dataset COPY.JOB contains the JCL to unload the datasets for all delivered products from the tape to your disk.

After that, you will have to perform the individual install procedure for each component.

Step 1 - Copy data set COPY.JOB from tape to disk

The data set COPY.JOB (label 2) contains the JCL to unload all other existing data sets from tape to disk. To unload COPY.JOB, use the following sample JCL:

```
//SAGTAPE JOB SAG,CLASS=1,MSGCLASS=X
//* -----------------------------
//COPY EXEC PGM=IEBGENER
//SYSUT1 DD DSN=COPY.JOB,
// DISP=(OLD,PASS),
// UNIT=(CASS,,DEFER),
// VOL=(,RETAIN,SER=<Tnnnnn>),
// LABEL=(2,SL)
//SYSUT2 DD DSN=<hilev>.COPY.JOB,
// DISP=(NEW,CATLG,DELETE),
// UNIT=3390,VOL=SER=<vvvvvv>,
// SPACE=(TRK,(1,1),RLSE),
// DCB=*.SYSUT1
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//
```

Where:

<hilev>	is a valid high level qualifier
<Tnnnnn>	is the tape number
<vvvvvv>	is the desired volser

Step 2 - Modify COPY.JOB to conform with your local naming conventions

There are three parameters you have to set before you can submit this job:

- Set HILEV to a valid high level qualifier.
- Set LOCATION to a storage location.
- Set EXPDT to a valid expiration date.

Step 3 - Submit COPY.JOB

Submit COPY.JOB to unload all other data sets from the tape to your disk.

Installation Procedure for Natural under OS/390

Step 1: Copy Natural Modules to an APF Library

(Job I009, Step 0100)

Copy the following Natural modules to an authorized program facility (APF) library:

NATAUMAT	Required if you want to install an Authorized-Service Manager (ASM).
NATAUPGT	
NATAUTRT	
NATBPMGR	Required if you want to install a Natural global buffer pool.
NATGBPMV	An ASM is needed if you want to have Natural global buffer pool propagation.
NATRSCFI	Required if you want to install a Natural roll server.
NATRSDRF	
NATRSMAT	
NATRSRDT	
NATRSSTT	
NATRSTRT	
NATRSWRT	

Step 2: Load the FNAT System File

(Job I050, Step 0100)

If you are installing into an existing Natural 3.1 FNAT file, skip this step.

Load the empty Natural system file (dataset NAT*nnn*.SYSF) using the ADALOD utility.

This file will contain all Natural objects supplied by Software AG. Its size depends on the number of products to be installed later. As a rule of thumb, 20 MB can be assumed for each major Software AG product.

The following ADALOD parameters must not be altered:

```
ISNREUSE=YES
VERSION=6
```

To avoid Natural errors NAT9988 and NAT7397 after reorganization of the FNAT system file using ADAULD/ADALOD, the parameter USERISN=YES should be left as set by System Maintenance Aid.

The file number *fnat* of the FNAT system file can be chosen as described under Natural profile parameter FNAT (see Profile Parameters in the Parameter Reference documentation).

Step 3: Load the FUSER System File

(Job I050, Step 0101)

You have the following options:

- You can use a new FUSER file for Version 3.1.
- You can use an existing Version 2.3 FUSER file to be shared by Versions 2.3 and 3.1.
- You can use an existing Version 2.2 FUSER file to be used by Version 3.1 only.
- You can use an existing Version 2.2 FUSER file to be shared by Versions 2.2 and 3.1.

Reuse an Existing 3.1 FUSER System File

If you want to use the existing Natural Version 3.1 FUSER system file, skip this step.

Use a New 3.1 FUSER System File - First-Time Installation

If you do **not** want to share the FUSER system file, proceed as follows:

Load the empty Natural user file contained in dataset NATnnn.SYSF using the ADALOD utility.

In this file, all user-written Natural programs are stored.

The following ADALOD parameters **must not** be altered:

```
ISNREUSE=YES
VERSION=6
```

The file number *fuser* of the FUSER system file can be chosen as described under Natural profile parameter FUSER (see Parameter Reference in the Natural Reference documentation).
For the use of a new and empty FUSER system file for Natural Version 3.1, no additional system-file-related actions are necessary.

Reuse an Existing 2.3 FUSER System File - Migration from Natural Version 2.3

If you want to use the existing Natural Version 2.3 FUSER system file and you do not want to share the FUSER system file, skip this step.

Using a Version 2.3 FUSER File to be shared by Natural Versions 2.3 and 3.1

If you use an existing Natural Version 2.3 FUSER system file to be shared by Natural Versions 2.3 and 3.1, you must upgrade your Natural Version 2.3 installation to Version 2.3.3 or 2.3.4.

Caution:
Do not use any Natural Version 2.3.2 or 2.3.1 utilities to manipulate libraries that contain objects of the type "class"! This would cause internal inconsistencies to the effect that Natural 3.1 would then no longer be able to find these objects in the FUSER file.

Using a Version 2.2 FUSER File to be shared by Natural Versions 2.2 and 3.1

If you use an existing Version 2.2 FUSER system file to be shared by Natural Versions 2.2 and 3.1, the version of the shared file must be at least 2.2.8.

Note:
If you already performed the steps described below (in the course of your Natural 2.3 installation) to use an existing FUSER file to be shared by Natural Versions 2.2 and 2.3, that file can be considered a Version 2.3 file. For such a file, see the preceding section Using a Version 2.3 FUSER File to be shared by Natural Versions 2.3 and 3.1.

To use a shared 2.2/3.1 FUSER file, before you install Natural Version 3.1, apply the following update INPL datasets to your Natural Version 2.2:

- NA2875 (if INPL Update NA228A2 not yet applied)
- NT2801 (only if Natural Connection is installed)
- NE2841 (only if Natural Security is installed and INPL Update NE22866 not yet applied)
- NA228B4 (only if Natural Security is installed)

- NQ3404 (only if Natural for DB2 is installed)
- NQ3405 (only if Natural for SQL/DS is installed)

Install Natural Version 3.1 as described in the operating-system-specific installation documents.

After you have installed Natural Version 3.1, replace all USR* modules you have copied from library SYSEXT into application libraries located in the Version 2.2 FUSER with the objects from the Version 3.1 library SYSEXT. The objects in the Version 3.1 library SYSEXT are cataloged with Version 2.2.

After you have discarded your Natural Version 2.2 environments, you should keep only modules belonging to your applications in library SYSTEM in FUSER and delete all Software AG objects from that library. If you are not sure which objects are part of your application and which are part of Natural, refer to the information given in SAGSIS Problem No. 176762.

The reasons for the above steps are as follows:

Under Version 2.2, Natural system programs were loaded with INPL into the library SYSTEM on the FUSER file; these programs are not compatible with Natural Version 3.1. The above update INPL datasets replace these programs with ones that can be executed under Versions 2.2 and 3.1.

With Version 2.2, Software AG objects to be loaded into the library SYSTEM were loaded into both the system files FNAT and FUSER; as of Version 2.3, they are only loaded into the FNAT file (that is, SYSTEM on FUSER no longer contains Software AG objects). Also, as of Version 2.3, the library SYSTEM on the FNAT file is the default steplib for user applications; with Version 2.2, it is not.

Attention:
Do not use any Version 2.2 Natural utilities to manipulate libraries that contain objects of the type "class"! This would cause internal inconsistencies to the effect that Natural 3.1 would then no longer be able to find these objects in the FUSER file.

Using a Version 2.2 FUSER File for Natural Version 3.1 Only - Migration from Natural Version 2.2

If you use an existing Version 2.2 FUSER system file for Natural Version 3.1, the version of the shared file must be at least 2.2.8.

To use a Version 2.2 FUSER file for Natural Version 3.1 only, that is, without using Natural Version 2.2 in parallel on that file, perform the following steps:

1. With the Version 2.2 SYSMAIN utility, move the entire contents of the Version 2.2 library SYSTEM on the FUSER file to a backup library.
2. Install Natural Version 3.1.
3. With the Version 3.1 SYSMAIN utility, copy all of your own application objects - but no Software AG objects that are part of Natural itself! - from the backup library back to the library SYSTEM of the FUSER file.
   If you are not sure which objects are part of your application and which are part of Natural, refer to the information given in SAGSIS Problem No. 176762.

The reasons for the above steps are as follows:

- Under Version 2.2, Natural system programs were loaded with INPL into the library SYSTEM on the FUSER file; these programs are not compatible with Natural Version 3.1. The above update INPL datasets replace these programs with ones that can be executed under Versions 2.2 and 3.1.
- With Version 2.2, Software AG objects to be loaded into the library SYSTEM were loaded into both the system files FNAT and FUSER; as of Version 2.3, they are only loaded into the FNAT file (that is, SYSTEM on FUSER no longer contains Software AG objects). Also, as of Version 2.3, the library SYSTEM on the FNAT file is the default steplib for user applications; with Version 2.2, it is not.

The file number *fuser* of the FUSER system file can be chosen as described under Natural profile parameter FUSER (see Profile Parameters in the Parameter Reference documentation).

Step 3.1: Load the FDIC System File

(Job I050, Step 0103)

Skip this step

- if you want to install Predict (in this case, use the corresponding installation step in the Predict Installation documentation), or
- if you want to use an existing FDIC system file (an existing FDIC system file can be shared by Natural Versions 2.2 and 3.1, or Versions 2.3 and 3.1), or
- if you do not use your own FDIC system file.

If Predict is used, the sharing of the FDIC system file requires that Predict Version 3.4.2 has been installed.

Load the empty FDIC file contained in dataset NAT*nnn*.SYSF using the ADALOD utility, as described below.

The following ADALOD parameters must not be altered:

```
ISNREUSE=YES
VERSION=6
```

The file number *fdic* of the FDIC system file can be chosen as described under Natural profile parameter FDIC (see Profile Parameters in the Parameter Reference documentation).

Step 3.2: Load the FSEC System File

Skip this step,

- if you do not use Natural Security, or
- if you want to use an existing FSEC system file, or
- if you do not want to use an own FSEC system file.

If you use Natural Security, refer to Installing Natural Security (in the Natural Installation Guide for Mainframes).

An existing Version 2.3.3 or 2.3.4 FSEC system file can be shared by Natural Security Versions 2.3 and 3.1. For details, read the section Using Multiple Versions of Natural Security in the Natural Version 3.1.2 Release Notes for Mainframes. These Release Notes are included in the RN Archive on the Natural Documentation CD.

If you use Natural Security, refer to Installing Natural Security (in the Natural Installation Guide for Mainframes).

Step 4: Load the Scratch-Pad File

(Job I050, Step 0102)

The scratch-pad system file can be used exclusively by the new Natural version or it can be shared by different versions of Natural.

If you do not want to use a scratch-pad file, skip this step.

If you do want to use a scratch-pad file; that is, if you want to use read-only system files (ROSY=ON), see also Natural Scratch-Pad File (in the Natural Operations for Mainframes documentation). Proceed as follows:

Load the empty scratch-pad file contained in dataset NAT*nnn*.SYSF using the ADALOD utility, as described below.

The following ADALOD parameters must not be altered:

```
ISNREUSE=YES
VERSION=6
```

For the optional scratch-pad file inclusion, the following NATPARM parameters must be added or, if already present, updated with:

```
LFILE=(212,dbid,fnr)
ROSY=ON
```

> **If you use SMA:** To be able to use a read-only system file, you have to set the parameter NAT-SCRF=Y and manually modify skeletons NAT-USER-PARM23-xxxx to include ROSY=ON.

Step 5: Assemble the Natural OS/390 Interface Module

(Job I055, Step 0100 or 0103)

The source program NATOS contains a call to the macro NTOS which generates the Natural OS/390 interface.

- Job I055, Step 0100 does the IEBUPDATE.
- Job I055, Step 0103 assembles and links NATOS.

Set the parameters in the source of the module NATOS to fit your requirements.

For a description of the Natural for OS/390 generation parameters contained in the macro NTOS, refer to NTOS Macro - Generation Parameters for Natural under OS/390 (in the Natural Operations for Mainframes documentation).

Assemble and link the Natural OS/390 interface module "NATOS" contained in the dataset NAT*nnn*.SRCE.

Step 6: Create the Natural Configuration Module

(Job I055, Step 0110)

Assemble and link the Natural Configuration Module (NATCONFG).

For more information on the configuration tables in NATCONFG, refer to Natural Configuration Tables (in the Natural Operations for Mainframes documentation).

Step 7: Create the Parameter Module

(Job I060, Steps 0010, 0015)

Create the Natural batch parameter module.

The following parameters in the parameter module must be modified for the installation:

```
FNAT=(dbid,fnat)
FUSER=(dbid,fuser)
```

For *dbid*, *fnat* and *fuser*, use the values you specified when loading the system files (see Steps 2 and 3).

> **Global Buffer Pool:** If you wish to use a *global* buffer pool, specify the macro NTBPI in all your Natural parameter modules.

For all other parameters: You can generally use the default values. Modify only the values of those parameters whose default values do not suit your requirements.

For a description of the individual parameters contained in the parameter module, refer to the Parameter Reference overview (in the Natural Reference documentation).

Assemble and link the parameter module.

Step 8: Link the Natural Nucleus

When linking the Natural nucleus, you have the following alternatives:

- Link a batch front-end (Job I060, Step 0020) and link a shared nucleus (Job I060, Step 0105) or
- link a non-shared nucleus (Job I060, Step 0020).

Using Alternative 1

1. Link a batch front-end (Job I060, Step 0020)
   If SMALOAD is APF authorized, and you use the OS/390 binder, link the batch nucleus as NORENT.
   With the INCLUDE instruction for the parameter module, specify the name of the Natural parameter module created in Step 7.
   The following modules must be included (include module NATOS first):

Module	Function
NATOS	Batch Natural driver
NATWKFO	Work file support
PR001B	Generated parameter module
ADAUSER	Adabas link module

   To access the shared nucleus, ensure that the NATPARM parameter NUCNAME contains the name of the module linked in Job I060, Step 0105.
   Link the batch front-end.

2. Link a shared nucleus (Job I060, Step 0105)
   For a list of the modules included, see Natural Shared Nucleus under OS/390 and VSE/ESA (in the Natural Operations for Mainframes documentation).
   Link the shared nucleus.

Using Alternative 2

Link a non-shared nucleus (Job I060, Step 0020)

If you use SMA: Ensure that parameter SHARED-NUC is set to 'N'. All the modules are then automatically linked in Step 0020
If you do not use SMA: Merge all INCLUDE statements and corresponding DD cards from Job I060, Step 0105 (shared nucleus) into Job I060, Step 0020 (front-end). Link the executable Natural nucleus.

Step 9: Load the System Programs

(Job I061, Step 0100)

Use the Natural utility INPL to load the Natural system objects (dataset NAT*nnn*.INPL) into the Natural system files.

Step 10: Load the Error Messages

(Job I061, Step 0102)

Load the Natural error messages file (dataset NAT*nnn*.ERRN) using the program ERRLODUS (described in the Natural SYSERR Utility documentation).

Step 11: Load the Examples

(Job I061, Step 0103)

Use the system command INPL to load the Natural example objects (dataset NAT*nnn*.EXPL) into the Natural system file.

Step 12: Load Possible INPL Updates

This step is only required if there are any INPL updates for Natural Version 2.3 on the installation tape. Please refer to the **Report of Tape Creation**.

Use the Natural system command INPL to load any Natural INPL updates.

Step 13: Create and Start the Global Buffer Pool

(Job I200, Step 0100)

This step must only be performed if you wish to use a global buffer pool.

Create and start the job STRTGBP1 before using Natural.

For further information on the global buffer pool, see Natural Global Buffer Pool (in the Natural Operations for Mainframes documentation).

Step 14: Create and Format the Roll File

(Job I200, Step 0101)

This step must only be performed if you wish to use the Natural Roll Server.

Create and start the job FORMRF1 before using Natural.

For further information on different types of roll files, see Natural under CICS and Natural under IMS/TM (in the Natural TP Monitor Interfaces documentation).

Step 15: Create and Start the Roll Server

(Job I200, Step 0102)

This step must only be performed if you wish to use the Natural Roll Server.

Create and start the job ROLLSV1 before using Natural.

For further information on the Natural Roll Server, see Natural Roll Server Operation (in the Natural Operations for Mainframes documentation).

Step 16: Create and Start the Authorized Services Manager

(Job I200, Step 0103)

This step must only be performed if you wish to use the Natural Authorized Services Manager.

Create and start the job AUTHSV1 before using Natural.

For further information, see Authorized-Services Manager (in the Natural Operations for Mainframes documentation).

Installation Verification for Natural under OS/390

For base Natural, there are no specific installation verification procedures.

After the last step of the installation procedure has been successfully performed, check that the following results are available:

- Communication between Adabas and Natural is working.
- The Natural system files have been loaded.
- Batch Natural is operational.